IN THE SPECIFICATION:

In paragraph [57] of the published application, please amend the following paragraph:

"ABSTRACT

a2

~~The invention is directed to~~ A method and apparatus is disclosed for acquiring and processing parameters used to adjust and tune a controller used, for example, to govern and compensate for motion, including vibrations and disturbances, in a physical system, such as a piece of manufacturing equipment. The ~~invention~~ method and apparatus may also be used to control, for example, a robot or other spatially dependent machine. ~~Included in the invention are~~ The method and apparatus may comprise systems and methods for generating a controller, and for controlling motion in a physical system or apparatus."

In paragraph [0019] of the published application, please amend the following paragraph:

a3

"Thus, according to one aspect of the invention, a system is provided to govern the behavior of a controller used to dictate motion of a machine component. The system includes a sensor that measures data that accurately characterizes the physical behavior of the component. The sensor takes its data reading when the component is not in normal use. The system also includes a processor which dynamically generates a fully coupled mathematical relation of minimal order based upon which the controller dictates component motion when the component is in normal use."

In paragraph [0038] of the published application, please amend the following paragraph:

a4

"where the elements of the parameter vector, .theta., are the coefficients, c.sub.ik, b.sub.kj, and p.sub.k. This parameterization offers two key advantages: 1) it has been demonstrated to have good numeric conditioning; 2) it can represent multivariable systems with minimal order. "Minimal order" in this context means the fewest number and can be coupled fully of states needed to accurately model the behavior of the plant. Of course, other parameterization methods may used instead, such as polynomial parameterization, pole-zero parameterization, and modal parameterization."

In paragraph [0059] of the published application, please amend the following paragraph:

"FIG. 1 shows a schematic illustration of a control system 80 according to the invention in which tuning is implemented. In normal mode, a switch 10 selects an output 12 of a controller 21 (typically a computer processor) as an input 13 to a plant 20 ("plant" being used herein as a generic term for the system being controlled, such as manufacturing equipment). This mode may also involve an input command which compared to a signal comprising a plant actuator output to get an error signal 11 input to the controller 21. When the system 80 is switched to tuning mode, the plant input 13 is switched to a function generator 15. Signals going into the plant, i.e., plant input 13, and coming out of the plant, i.e. plant output 17 (from sensors in the plant), including the addition of any system disturbances 9, combined in a sumer 17a are provided as a signal 16 to a model estimator 18 where the signal 16 is analyzed and an internal model of the system is updated to reflect the new data. Model estimation 18 is passed to a tuning algorithm 19, which adjusts or tunes the controller 21 to maximize stability and performance. The updated, or tuned, controller parameters (dotted line) [~~then~~] installed or written into the controller 21 at, for example, an electronic memory location. Then, the switch 10 is toggled to begin controlling the system in normal operation."

In paragraph [0061] of the published application, please amend the following paragraph:

"FIG. 3 shows an alternative procedure by which control parameters can be updated for a system or plant 20. In this embodiment, an event 51 occurs which causes the system to switch the secondary processor (or a host personal computer PC) 27 into data acquisition mode 52. Events 51 that might initiate this change include a command generated by an operator, a command generated as a result of a clock in communication with the system, or a change in the performance of the system. In this embodiment, when the secondary processor 27 is placed into data acquisition mode it generates at least one signal that is applied to amplifier(s) 22, which then applies at least one signal to the actuators or

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motors 23. The actuators or motors 23 command some motion or action in the manufacturing equipment 24. The motion or action results in the sensor(s) 25 generating at least one sensor signal that is at least partly responsive to the motion or action generated by the actuators 23 upon the manufacturing equipment 24. The sensor signal is then conditioned and passed back to the processor 27. At this point, the processor 27 would follow the procedure illustrated in FIG. 5 following the point at which the system acquires new data in data acquisition mode 53. Once the new controller or control parameters, 55 or 56, are created according to FIG. 5, secondary processor 27 would write or install the controller or control parameters into processor 21 according to step 57 in Fig. 5. The system would then switch into controller mode 58."

In paragraph [0063] of the published application, please amend the following paragraph:

A7

"FIG. 6 illustrates one embodiment of a feedback control system that could be used on a piece of manufacturing equipment. In this embodiment, the manufacturing equipment 40 sends a signal 81 to a communication module 41. The module 41 then sends the signal to the processor 42. This signal may correspond to the event 51 that is described as part of FIG. 5. The processor [4~~1~~] [42] then sends a signal [86] to amplifier 46 that then sends a signal 87 to the actuator/motor 45. Actuator/motor 45 then acts on the manufacturing equipment 40 with a signal 88. A sensor 44 then measures the behavior of the manufacturing equipment 40 due to the effect the actuator/motor has upon the manufacturing equipment 40 indicated by signal 83. The sensor 44 then sends a signal [84] to signal conditioning unit 43. Signal conditioning unit 43 then sends signal 85 to the processor[42] . By way of example, processor 42 might be Model SBC67 supplied by Innovative Integration Inc. with offices in Simi Valley, Calif. This processor is a high performance stand-alone digital signal processor single board computer featuring analog input and output capability."